

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application;

--1. (Currently Amended) An automatic gain adjustment device of a feedback control system ~~which~~ that uses a phase difference between an output signal obtained from a controlled object and an input signal while controlling the object based on the input signal, the automatic gain adjustment device comprising

phase shifting means[[],] connected to an input stage of the feedback control system[[],] for shifting a phase of the input signal, wherein

a phase shift amount of the phase shifting means is set ~~such~~ so that a frequency of the input signal to be supplied to a closed loop coincides with a crossover frequency at which an open loop gain ~~forming~~ of the feedback control system becomes 0 dB.

--2. (Currently Amended) The automatic gain adjustment device according to claim 1, further comprising:

a multiplier for multiplying the input signal and the output signal obtained from the controlled object; and

an integrator for integrating ~~multiplied~~ product results of the multiplier, wherein

the open loop gain is converged to 0 dB by adjusting a

gain of the feedback control system based on a sign of an output value of the integrator.

--3. (Currently Amended) The automatic gain adjustment device according to claim 1, wherein

the open loop gain is converged to 0 dB using a bisection method.

--4. (Currently Amended) An automatic gain adjustment method for a feedback control system, ~~which~~ that uses a phase difference between an output signal obtained from a controlled object and an input signal while controlling the object based on the input signal, the automatic gain adjustment method comprising the steps of:

setting a phase shift amount such so that a frequency of the input signal to be supplied to a closed loop coincides with a crossover frequency at which an open loop gain forming of the feedback control system becomes 0 dB; and

shifting a phase of the input signal based on the phase shift amount set in said step of setting.

--5. (Currently Amended) The automatic gain adjustment method according to claim 4, further comprising the steps of:

multiplying the input signal and the output signal obtained from the controlled object;

integrating results of the multiplication step of multiplying; and

converging the open loop gain to 0 dB by adjusting a gain of the feedback control system based on a sign of an output value that has been integrated in the step of integrating.

--6. (Currently Amended) The automatic gain adjustment method according to claim 4, wherein

the open loop gain is converged to 0 dB using a bisection method.